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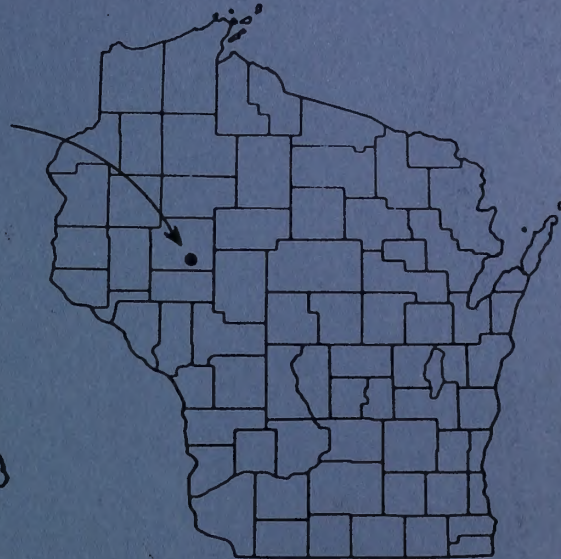
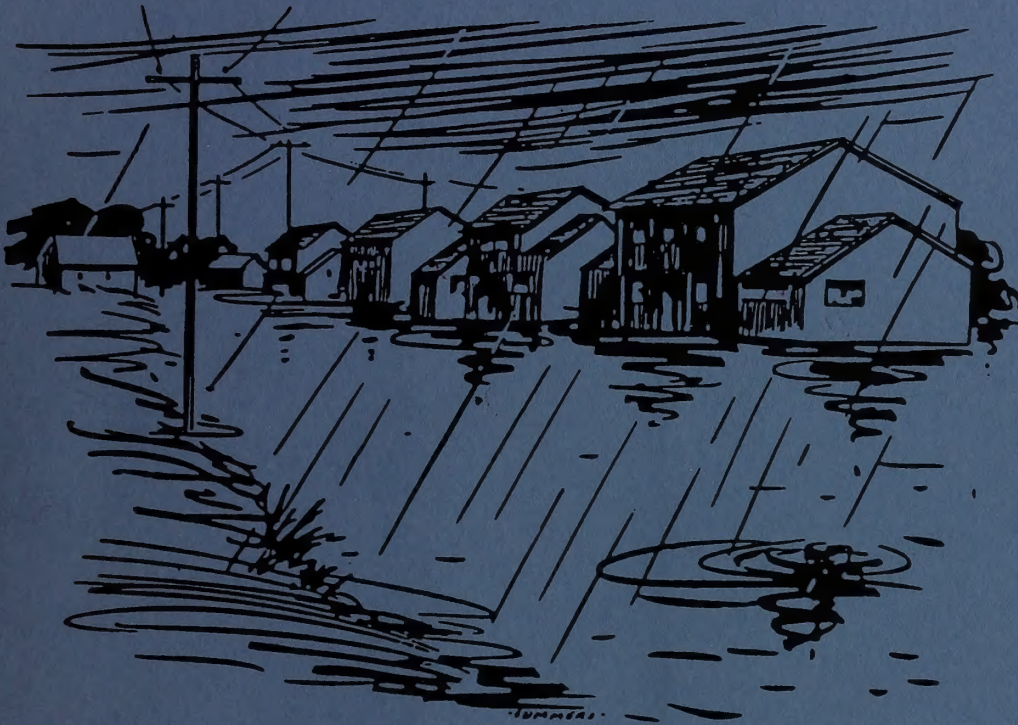
Reserve
CTC424
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FLOODPLAIN MANAGEMENT STUDY

VILLAGE OF CADOTT

CHIPPEWA COUNTY, WISCONSIN

VILLAGE OF CADOTT



PREPARED BY THE
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MADISON, WISCONSIN
IN COOPERATION WITH
CHIPPEWA COUNTY , WISCONSIN
AND THE
WISCONSIN DEPARTMENT OF NATURAL RESOURCES
APRIL 1985

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JUL 23 1987

CATALOGING = PREP.

Village of Cadott Floodplain Management Study

Introduction

The purpose of this study is to define the flood characteristics of the Yellow River within the corporate limits of the village. The village of Cadott requested the study through Chippewa County and the Wisconsin Department of Natural Resources (DNR).

This report is prepared for use by the local people in planning the use and regulation of the floodplain within the village.

The 100-year floodplain has been delineated. The high water elevations and floodplain deliniations are based on 5-year projected land use of the watershed, stream, floodplain, and existing road crossings.

The Soil Conservation Service carries out flood hazard studies in accordance with Federal Level Recommendation 3 of "A Unified National Program for Floodplain Management," and Section 6 of Public Law 83-566. The principles contained in Executive Order 11988, Floodplain Management, are addressed in this part.

In Wisconsin, the Soil Conservation Service coordinates floodplain management studies with the Wisconsin DNR, through a joint coordination agreement entered into in October 1978. The Wisconsin Water Resources Act (Chapter 614, Laws of Wisconsin, 1965) authorizes the DNR, Division of Enforcement, to establish and upgrade minimum standards for floodplain regulations.

Study Area Description

The village of Cadott is in the south central portion of Chippewa County, east of the city of Chippewa Falls. Chippewa County is located in the northern part of west central Wisconsin. The study area consists of the floodplain of the Yellow River within the corporate limits.

The Yellow River has a contributing drainage area of 351 square miles. The United States Geological Survey (USGS) has maintained a stream recording gage at the State Highway 27 bridge since 1943. The flows used in the study are based on a statistical analysis of the gage data. The study area is in USGS Hydrologic Unit 07050005.

The climate is typically continental. January temperatures average 20.5°F. August, the warmest month, has an average temperature of 70.1°F. Precipitation averages 30 inches per year.

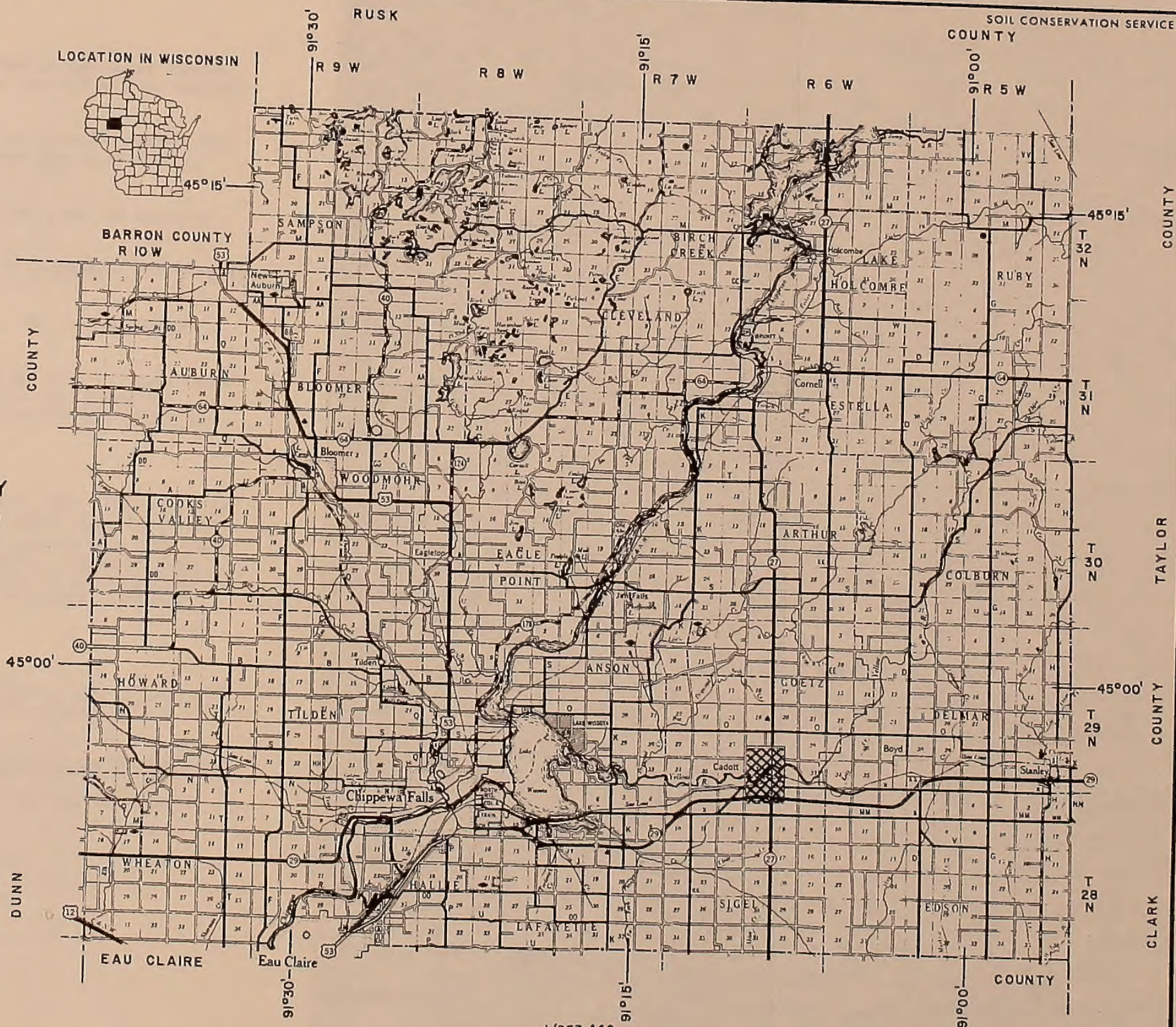
The soils of the watershed consist of the Magnor-Almena-Spencer association which consists of nearly level to sloping, moderately well to somewhat poorly drained soils that have a loamy or silty subsoil underlain by loamy till deposits.



LOCATION IN WISCONSIN



CHIPPEWA COUNTY
SOIL AND WATER
CONSERVATION
DISTRICT
WISCONSIN



Source: County Highway Map 1971

1/253,440
SCALE 1 0 1 2 3 4 5 MILES

POLYCONIC PROJECTION

Revised 8-30-71
5,N-29,520

Natural and Beneficial Floodplain Values

The Yellow River fishery resource consists of a number of warm-water species, of which channel catfish, walleyes, muskellunge, smallmouth bass, and redhorse are the most common.

The Cadott Flowage contains several sport fish species including muskellunge, northern pike, walleye, largemouth and smallmouth bass, perch, bluegills, black crappies, and channel catfish.

Because of the Flowage's nearness to a highly developed area, its waterfowl and other wildlife value is limited.

The county park on the Flowage provides a good deal of recreation for village residents.

Most of the study area is surrounded by development. Most of the stream corridor is tree-lined.

By maintaining the undeveloped floodplain several things will be accomplished including preservation of natural beauty, protection against shoreline erosion, noise absorption and protection of wildlife habitat for songbirds, squirrels, and other small mammals.

Flooding Problems

Flooding has occurred on the Yellow River in 1941, 1943, 1958, 1965, 1967, and 1973. The 1965 flood was two feet deep in the sewage plant rendering it useless. The Corps of Engineers assisted the village in constructing a protective dike around the plant so this would not occur again. The Miller residence adjacent to the sewage plant had 4 inches of water in the house during the flood of April 1967. The residence was elevated 40 inches to prevent future flooding.

Existing Floodplain Management

The village of Cadott does not have a floodplain ordinance. The village is under the emergency phase of the National Flood Insurance Program and is using a flood hazard map.

Alternatives for Mitigating Flood Damages to Existing and Future Development

- A. The village will incorporate the floodplain maps from this study into a floodplain ordinance and provide enforcement.



Appendix A

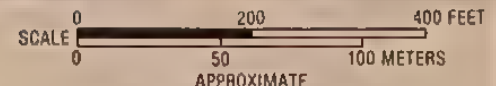
FLOOD BOUNDARY MAPS



LEGEND

- 100 Year Floodplain Area
- 100 Year Flood Fringe
- (964.7) Flood Elevation
- Cross Section Location
- RM 3 Reference Mark
- Floodway Line

LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND AND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION



APPROXIMATE
JULY 1978 PHOTOGRAPHY FROM
WISCONSIN D.O.T

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF CADOTT FLOOD PLAIN MANAGEMENT STUDY
CHIPPEWA COUNTY WISCONSIN

FLOOD HAZARD AREA

YELLOW RIVER



LEGEND

 100 Year Floodplain Area	 Cross Section Location
 100 Year Flood Fringe	 RM 3 Reference Mark
(964.7) Flood Elevation	 Floodway Line

LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND AND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION

0 200 400 FEET
0 50 100 METERS
SCALE
APPROXIMATE
JULY 1978 PHOTOGRAPHY FROM
WISCONSIN D O T

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF CADOTT FLOOD PLAIN MANAGEMENT STUDY
CHIPPEWA COUNTY WISCONSIN

FLOOD HAZARD AREA

YELLOW RIVER



LEGEND

100 Year Floodplain Area (P) Cross Section Location

100 Year Flood Fringe X RM 3 Reference Mark

(964.7) Flood Elevation — Floodway Line






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SCALE 0 200 400 FEET
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APPROXIMATE

JULY 1978 PHOTOGRAPHY FROM WISCONSIN D.O.T



LEGEND

	100 Year Floodplain Area		Cross Section Location
	100 Year Flood Fringe		RM 3 Reference Mark
(964.7)	Flood Elevation		Floodway Line

LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND AND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION

SCALE 0 200 400 FEET
0 50 100 METERS
APPROXIMATE
JULY 1978 PHOTOGRAPHY FROM WISCONSIN D.O.T

SHEET 4 of 4	U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE VILLAGE OF CADOTT FLOOD PLAIN MANAGEMENT STUDY CHIPPEWA COUNTY WISCONSIN	FLOOD HAZARD AREA YELLOW RIVER
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Appendix B

FLOOD PROFILES

CORPORATE LIMITS

960

940

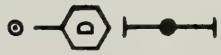
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ELEVATIONS IN FEET (MSL)

LEGEND

- 500-YEAR FLOOD
- 100-YEAR FLOOD
- 50-YEAR FLOOD
- 10-YEAR FLOOD
- STREAM BED
- HIGH WATER MARK

- CROSS SECTION LOCATION
- BRIDGE FLOOR
- LOW POINT IN ROAD
- LOW CHORD



STATIONS IN FEET

10+00

5+00

15+00

25+00

20+00

YELLOW RIVER
VILLAGE OF CADOTT
FLOOD PLAIN MANAGEMENT STUDY
CHIPPEWA COUNTY, WISCONSIN
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

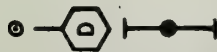
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Drawn by	M. MORRIS	Revised by	6/94
Checked by	J. MILLIGAN	Revised by	6/94
Reviewed by		Revised by	
Approved by		Revised by	
Scale		Revised by	
Sheet	1	Revised by	
of	5	Revised by	

LEGEND

500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
STREAM BED
HIGH WATER MARK

CROSS SECTION LOCATION

BRIDGE FLOOR
LOW POINT IN ROAD
LOW CHORD



ELEVATIONS IN FEET (MSL)

970

960

950

940

930

26+00

30+00

35+00

40+00

STATIONS IN FEET

45+00

50+00

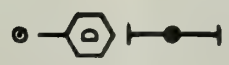
YELLOW RIVER
VILLAGE OF CADOTT
FLOOD PLAN MANAGEMENT STUDY
CHIPPEWA COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed by J. MELLIGAN	Date 9/84	Approved by M. MORRIS	Date 6/84	Drawn by J. MELLIGAN	Date 9/84	Checked by J. MELLIGAN	Date 9/84	Scale 1" = 5'	Sheet 2 of 5
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LEGEND

- 500-YEAR FLOOD
- 100-YEAR FLOOD
- 50-YEAR FLOOD
- 10-YEAR FLOOD
- STREAM BED
- HIGH WATER MARK



- CROSS SECTION LOCATION
- BRIDGE FLOOR
 - LOW POINT IN ROAD
 - LOW CHORD

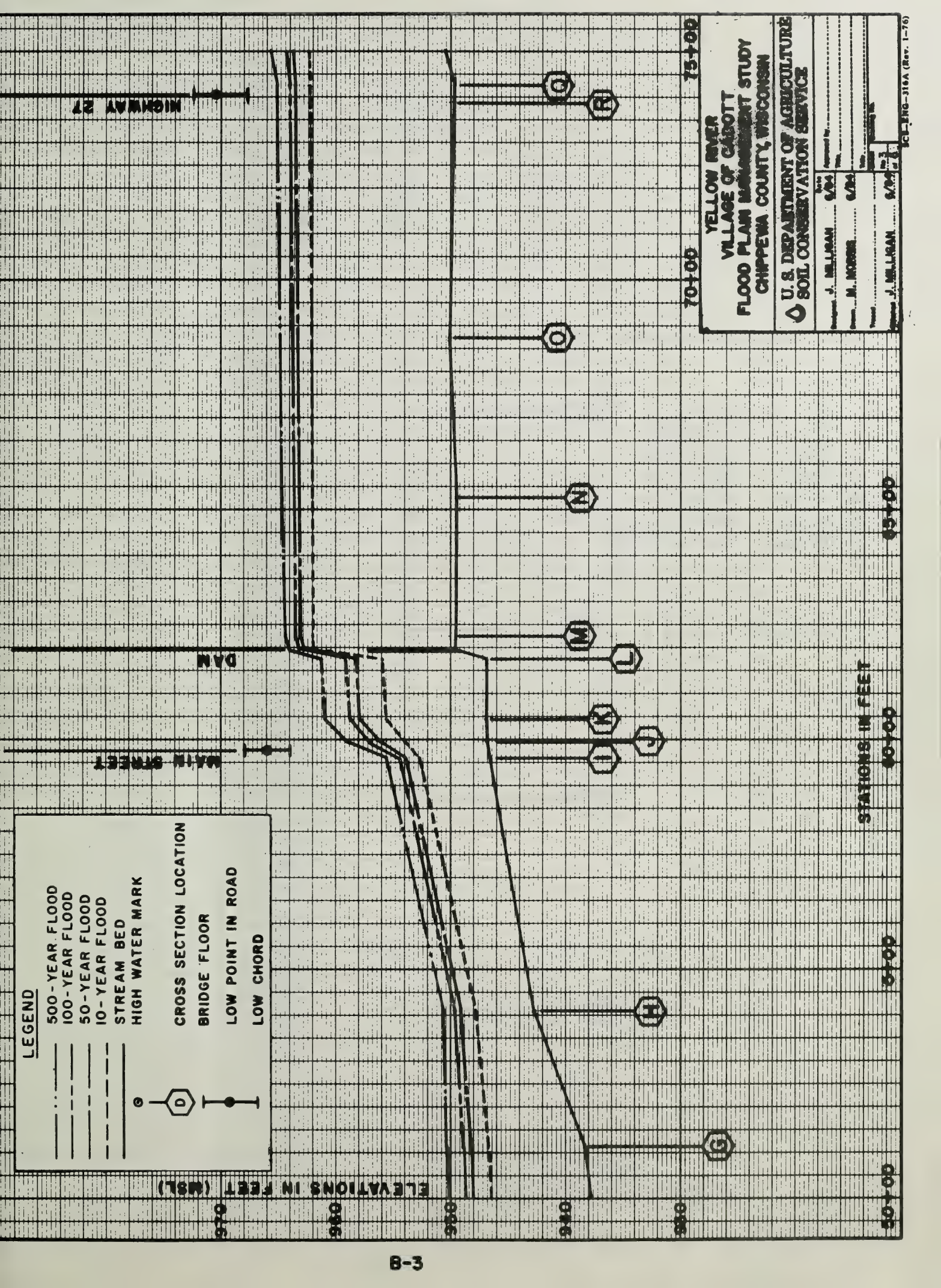
ELEVATIONS IN FEET (MSL)

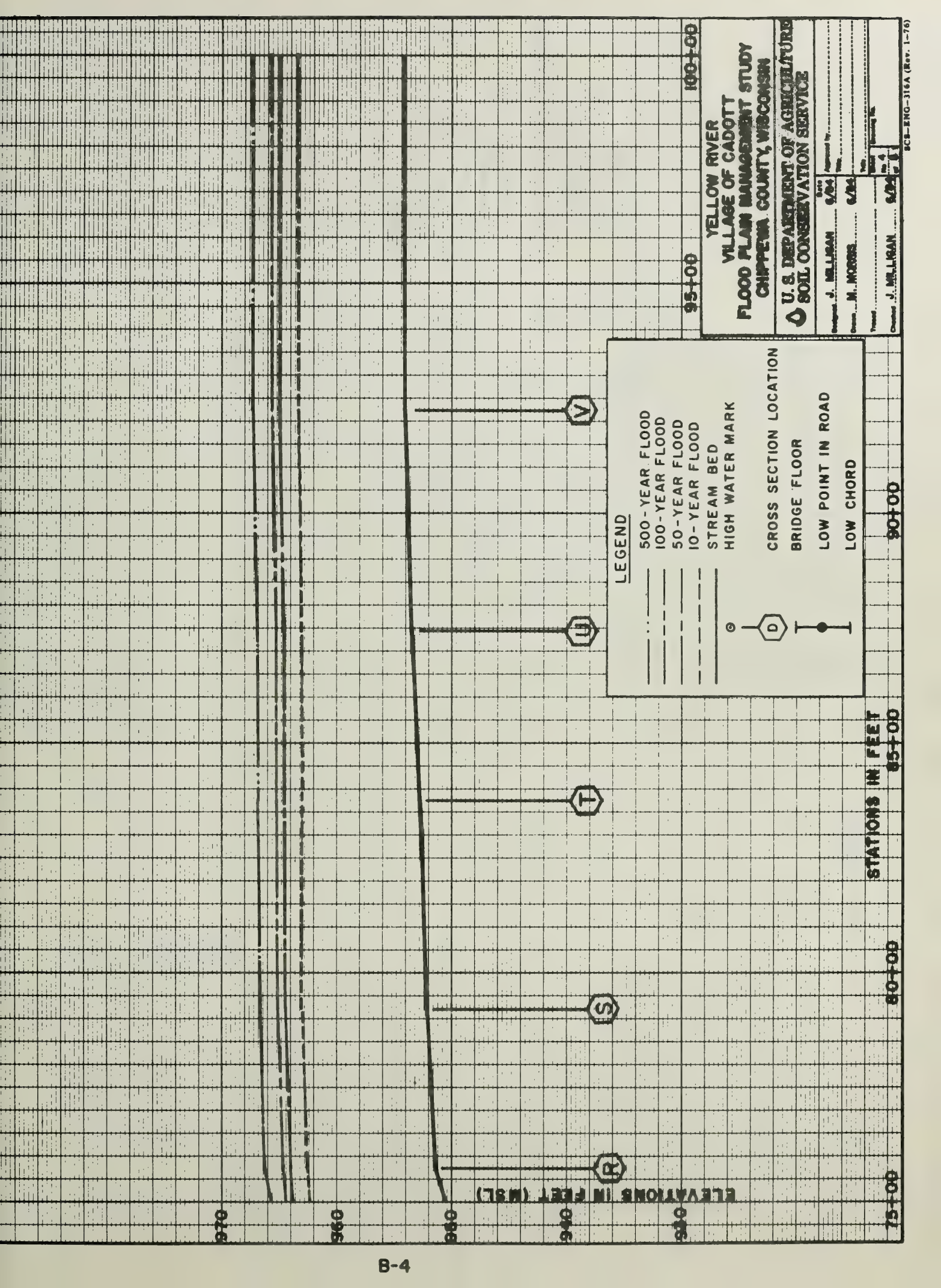
STATIONS IN FEET

YELLOW RIVER
VILLAGE OF GAROTT
FLOOD PLAN MANAGEMENT STUDY
CHIPPEWA COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Project No.	6/74
Drawn	M. MOORE
Check	J. MELLERAN
Date	6/74





STUDY LIMIT
CORPORATE LIMIT

970

980

990

990

990

ELEVATIONS IN FEET (MSL)

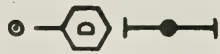
STATIONS IN FEET

105+00

100+00

LEGEND

- 500-YEAR FLOOD
- 100-YEAR FLOOD
- 50-YEAR FLOOD
- 10-YEAR FLOOD
- STREAM BED
- HIGH WATER MARK



- CROSS SECTION LOCATION
- BRIDGE FLOOR
- LOW POINT IN ROAD
- LOW CHORD

YELLOW RIVER
VILLAGE OF CADOTT
FLOOD PLAIN MANAGEMENT STUDY
CHIPPewa COUNTY, WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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Appendix C

TYPICAL SECTIONS

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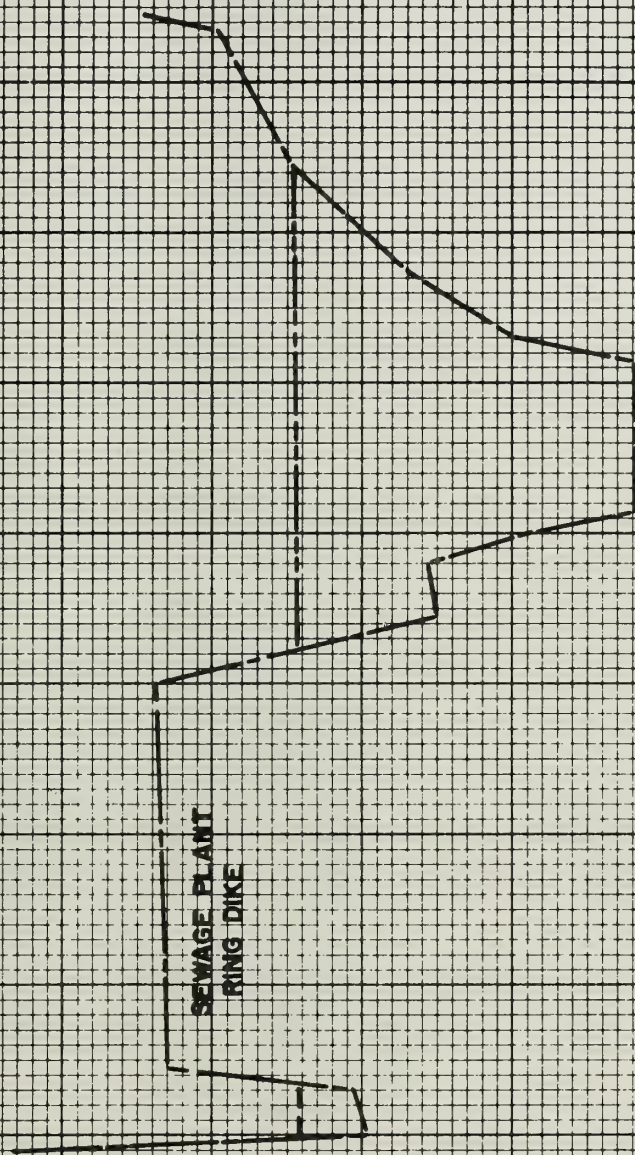
945

940

935

930

ELEVATIONS IN FEET (MSL)



600

700

800

900

1000

1100

1200

1300

1400

1500

DISTANCE IN FEET
CROSS - SECTION "D"

LEGEND

--- 100-YEAR FLOOD
--- GROUND LINE

TYPICAL CROSS SECTION

YELLOW RIVER

VILLAGE OF CADOTT

FLOOD PLAIN MANAGEMENT STUDY

CHIPPEWA COUNTY, WISCONSIN

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

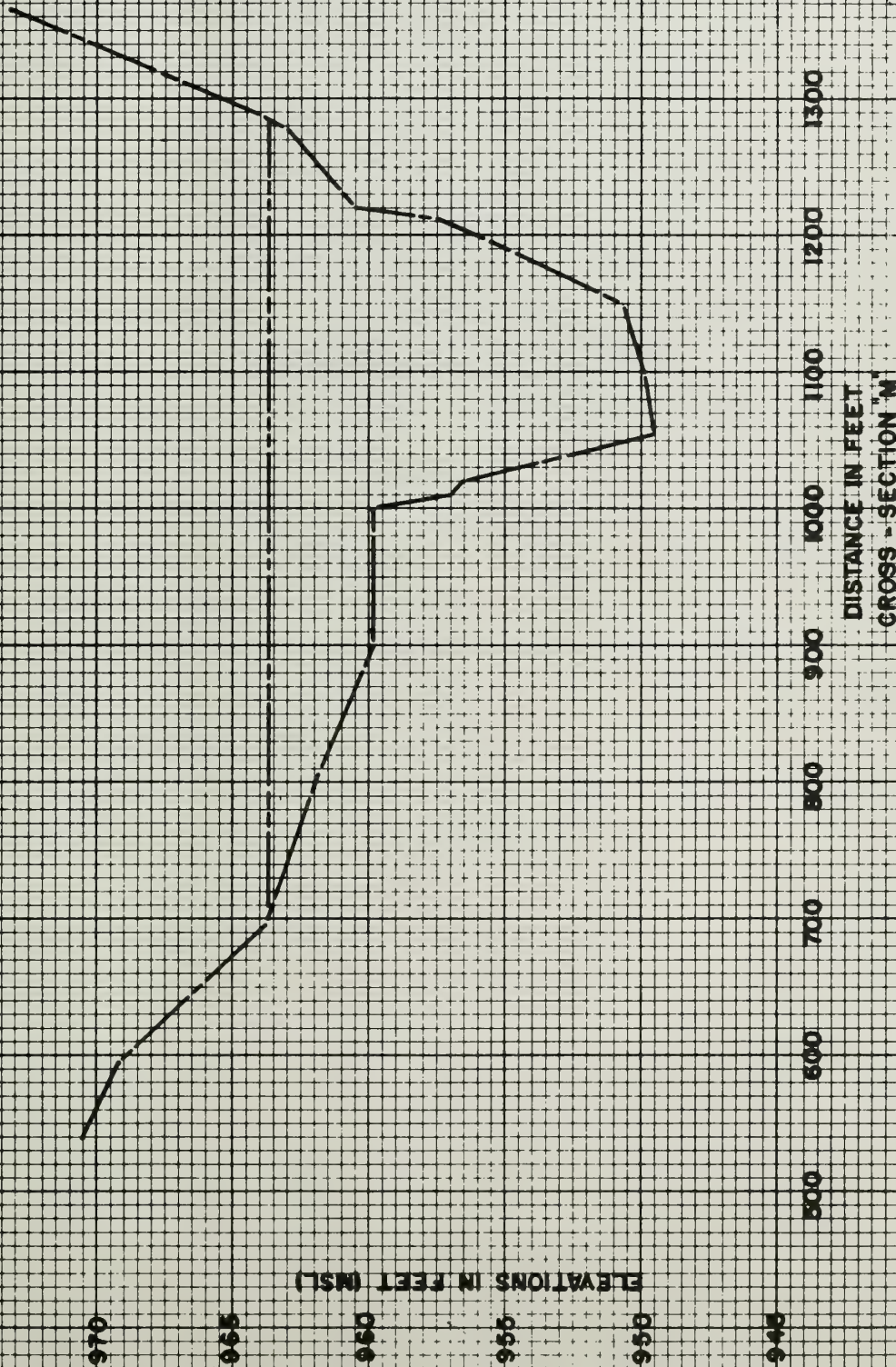
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Checked J. MILLIGAN 6/84

Revised



LEGEND
 --- 100-YEAR FLOOD
 --- GROUND LINE

TYPICAL CROSS SECTION

**YELLOW RIVER
 VILLAGE OF CADOTT
 FLOOD PLAIN MANAGEMENT STUDY
 CHIPPEWA COUNTY, WISCONSIN**

**U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE**

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Drawn by M. MORRIS		Traced by J. MILLIGAN	Date 6/94
Sheet No. 1		Drawing No. 1	

Appendix D

ELEVATION REFERENCE MARKS

ELEVATION REFERENCE MARKS

<u>Reference Mark</u>	<u>Elev. (MSL)</u>	<u>Description</u>
1	959.55	B.M.-Bronze cap in rock in NW corner of dam, north side of river.
2	972.06	TBM2-Chiseled "X" on top of SW bridge abutment, Highway 27.
3	966.67	TBM4-Nail in base of power pole on left bank (south), on 1/4 section line, approximately 1,300 feet upstream of Hwy. 27.
4	944.53	TBM8-Nail in base of 8 inch diameter box elder tree 1,400 feet downstream of the Main Street bridge, on L. Rykal property.
5	955.49	TBM9-Top of latch hook on steel cover of storm sewer at the end of Yellow Street.
6	948.06	TBM12-Top of fire hydrant 90' NE of sewer plant fence.
7	962.99	TBM7-Top of fire hydrant on south side of Yellow Street 865 feet from Main Street.

Appendix E

TABULATION OF
WATER SURFACE ELEVATIONS
DISCHARGES
AND
FLOODWAY TABLES

Flooding Source		Discharge - Elevation									
Cross-section	Distance $\frac{1}{2}$	10 year		50 year		100 year		500 year			
		Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL	Q CFS	Elev. MSL		
Yellow River	0	8740	939.5	13140	941.0	15170	942.8	20300	944.5		
Corporate Limit	1460	8740	943.7	13140	945.3	15170	945.9	20300	947.3		
A	2910	8740	944.8	13140	946.2	15170	946.8	20300	948.2		
B	3360	8740	944.9	13140	946.3	15170	946.9	20300	948.3		
C	3910	8740	945.3	13140	946.6	15170	947.1	20300	948.2		
D	4160	8740	945.5	13140	946.8	15170	947.4	20300	948.6		
E	4560	8740	946.1	13140	947.7	15170	948.4	20300	949.4		
F	5110	8740	946.7	13140	948.4	15170	949.0	20300	950.4		
G	5460	8740	947.9	13140	949.1	15170	949.6	20300	950.7		
H	5960	8740	952.8	13140	953.9	15170	954.4	20300	955.6		
I	5978	Main Street									
J	5995	8740	954.0	13140	956.1	15170	957.0	20300	959.0		
K	6045	8740	955.5	13140	957.0	15170	958.8	20300	961.0		
L	6175	8740	955.9	13140	958.2	15170	959.1	20300	961.3		
M	6195	DAM									
N	6225	8740	962.0	13140	963.0	15170	963.4	20300	964.4		
O	6525	8740	962.1	13140	963.2	15170	963.6	20300	964.7		
P	6875	8740	962.1	13140	963.3	15170	963.8	20300	964.8		
Q	7387	8740	962.4	13140	963.6	15170	964.1	20300	965.2		
R	7400	State Highway 27 Bridge									
S	7425	8740	792.4	13140	963.6	15170	964.1	20300	965.2		
T	7575	8740	962.7	13140	964.1	15170	964.7	20300	966.3		
U	7925	8740	963.0	13140	964.5	15170	965.2	20300	966.8		
V	8375	8740	963.1	13140	964.7	15170	965.3	20300	966.9		
Corporate Limit	8745	8740	963.1	13140	964.7	15170	965.3	20300	966.9		
	9225	8740	963.5	13140	965.1	15170	965.8	20300	967.5		
	10305	8740	963.6	13140	965.1	15170	965.8	20300	967.5		

1/ Distance in feet from corporate limits

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF CADOTT
FLOODPLAIN MANAGEMENT STUDY
CHIPPEWA COUNTY, WISCONSIN

DISCHARGE - ELEVATION DATA

YELLOW RIVER

TABLE 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION ²		
CROSS SECTION	DISTANCE ¹	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (M.S.L.)	WITHOUT FLOODWAY (M.S.L.)	DIFFERENCE (FT.)
A	1460	833	5271	2.9	945.9	945.9	0.0
B	2910	1126	6152	2.5	946.8	946.8	0.0
C	3360	953	3969	3.8	946.9	946.9	0.0
D	3910	316	2047	7.4	947.1	947.1	0.0
E	4160	237	1701	8.9	947.4	947.4	0.0
F	4560	233	1982	7.7	948.3	948.3	0.0
G	5110	273	1939	7.8	949.0	949.0	0.0
H	5460	220	1159	13.1	949.6	949.6	0.0
I	5960	172	1058	14.3	954.1	954.1	0.0
J	5995	149	1211	12.5	957.0	957.0	0.0
K	6045	217	2003	7.6	958.8	958.8	0.0
L	6175	218	2067	7.3	959.1	959.1	0.0
M	6225	566	3157	4.8	963.4	963.4	0.0
N	6525	579	3274	4.6	963.6	963.6	0.0
O	6875	497	2883	5.3	963.8	963.8	0.0
P	7387	197	2256	6.7	964.1	964.1	0.0
Q	7425	177	1921	7.9	964.1	964.1	0.0
R	7575	628	3442	4.4	964.7	964.7	0.0
S	7925	764	4562	3.3	965.2	965.2	0.0
T	8375	755	5064	3.0	965.3	965.3	0.0
U	8745	602	3846	3.9	965.3	965.3	0.0
V	9225	1440	7565	2.0	965.8	965.8	0.0

^{1/} Distance in feet from corporate limits

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VILLAGE OF CADOTT
FLOODPLAIN MANAGEMENT STUDY
CHIPPEWA COUNTY, WISCONSIN

FLOODWAY DATA

YELLOW RIVER

TABLE 2

Appendix F

INVESTIGATIONS AND ANALYSIS

Investigation and Analysis

The flows used in the study were obtained by a statistical analysis of the USGS gage data. The gage is located at the State Highway 27 bridge. The gage is listed as gage No. 05354000 and has 40 years of records. The data was analysed using the procedure of Bulletin #17B(6) and using a zero skew to conform to Wis. Adm. Code NR116.(7).

Surveyed cross sections were obtained as well as bridge and dam measurements. The data collected was used to compile a model of the river using a step backwater program developed by the U.S. Army Corps of Engineers Title HEC-2 Water Surface Profiles. This program was used at the request of the DNR engineers so as to have a continuous model of the Yellow River using the same program.

The results are shown in Appendix A, B, and E of this report. The encroachment used to show the effects of the sewage plant dike and the elevating/floodproofing of the Miller residence (cross-section E) are reflected in the floodway table. The floodproofing of the Miller residence caused a rise in the flood profile of less than 0.1 foot at the next cross-section upstream.

Appendix G

GLOSSARY

GLOSSARY

CHAPTER NR. 116, WISCONSIN'S FLOOD PLAIN MANAGEMENT PROGRAM NR. 116.03 DEFINITIONS

Channel. A channel is a natural or artificial watercourse with definite bed and banks to confine and conduct the normal flow of water.

Department. Department refers to the State of Wisconsin Department of Natural Resources.

Encroachment. An encroachment is any fill, structure, building, use, accessory use, or development in the floodway.

Encroachment/Floodway Lines. Encroachment/floodway lines are limits of obstruction to floodflows. These lines are on both sides of and generally parallel to the river or stream. The lines are established by assuming that the area landward (outside) of the encroachment/floodway lines will be ultimately developed in such a way that it will not be available to convey floodflows.

Equal Degree of Hydraulic Encroachment. The effect of any encroachment into the floodway must be computed by assuming an equal degree of hydraulic encroachment on the other side of a river or stream for a hydraulic reach. This computation assures that property owners up, down, or across the river or stream will have the same rights of hydraulic encroachment. Encroachments are analyzed on the basis of the effect upon hydraulic conveyance, not upon the distance the encroachment extends into the floodway. Also see: Hydraulic Reach.

Flood. A general and temporary condition of partial or complete inundation of normally dry land areas caused by the overflow or rise of rivers, streams, or lakes.

Flood Frequency. The term flood frequency is a means of expressing the probability of flood occurrences and is generally determined from statistical analyses. The frequency of a particular floodflow is usually expressed as occurring, on the average, once in a specified number of years. Any particular floodflow could, however, occur more frequently than once in any given year.

Flood Fringe. The flood fringe is that portion of the flood plain outside of the floodway, which is covered by floodwaters during the regional flood; it is generally associated with standing water rather than rapidly flowing water.

Flood Plain. The flood plain is the land which has been or may be hereafter covered by floodwater during the regional flood. The flood plain includes the floodway and the flood fringe.

Flood Plain Management. Flood plain management involves the full range of public policy and action for insuring wise use of flood plains. It includes everything from the collection and dissemination of flood control information to actual acquisition of flood plain lands; and the enactment and administration of codes, ordinances, and statutes for land use in the flood plain.

Flood Proofing. Flood proofing involves any combination of structural provisions, changes, or adjustments to properties and structures subject to flooding, primarily for the purpose of reducing or eliminating flood damage to properties, water and sanitary facilities, structures and contents of buildings in flood hazard areas.

Flood Protection Elevation. The flood protection elevation shall correspond to a point 2 feet of freeboard above the water surface profile associated with the regional flood and the official floodway lines. Also see: Freeboard.

Floodway. The floodway is the channel of a river or stream and those portions of the flood plain adjoining the channel required to carry and discharge the floodwater or floodflows associated with the regional flood.

Freeboard. Freeboard is a factor of safety usually expressed in terms of a certain amount of feet above a calculated flood level. Freeboard compensates for the many unknown factors that contribute to flood heights greater than the height calculated. These unknown factors include, but are not limited to, ice jams, debris accumulation, wave action, obstruction of bridge openings and floodways, the effects of urbanization on the hydrology of the watershed, loss of flood storage areas due to development and aggradation of the river or streambed.

High Flood Damage Potential. High flood damage potential is associated with any danger to life or health and any significant economic loss to a structure or building or its contents.

Hydraulic Floodway Lines. Hydraulic floodway lines shall delineate the channel of the river or stream and those portions of the adjoining flood plains which are reasonably required to carry and discharge the regional floodflow without any measurable increase in flood heights.

Hydraulic Reach. A hydraulic reach along a river or stream is that portion of the river or stream extending from one significant change in the hydraulic character of the river or stream to the next significant change. These changes are usually associated with breaks in the slope of the water surface profile, and may be caused by bridges, dams, expansion and contraction of the waterflow, and changes in streambed slope or vegetation.

Levee. A levee is a continuous dike or embankment of earth constructed parallel to a river or stream to prevent flooding of certain areas of land.

Official Floodway Lines. Official floodway lines are those lines which have been adopted by the county, city, or village, approved by the department, and which are shown on the official flood plain zoning maps and used for regulatory purposes.

Regional Flood. The regional flood is a flood determined to be representative of large floods known to have generally occurred in Wisconsin and which may be expected to occur on a particular stream because of like physical characteristics. The regional flood is based upon a statistical analysis of streamflow records available for the watershed and/or an analysis of rainfall and runoff characteristics in the general watershed region. The flood frequency of the regional flood is once in every 100 years; this means that in any given year there is a 1 percent chance that the regional flood may occur. During a typical 30-year mortgage period, the regional flood has a 26 percent chance of occurring.

Structure. A structure is any manmade object with form, shape, and utility, either permanently or temporarily attached to or placed upon the ground, riverbed, streambed, or lakebed.

Watershed. A watershed is a region or area contributing ultimately to the water supply of a particular watercourse or body of water.

Water Surface Profile. The water surface profile is a graphical representation of the height of the water surface throughout a county, city, or village based upon a certain flow passing through the river or stream. A water surface profile based upon flows occurring during a regional flood is used in regulating the flood plain areas.

Appendix H

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